Claims

WHAT IS CLAIMED IS:

1. A method comprising:

determining a first cost associated with a logical network link between an active node and a first neighboring node of the active node within an overlay network;

determining a second cost associated with a proposed logical network link between the first neighboring node and a second neighboring node of the active node within the overlay network; and

reorganizing the overlay network to replace the logical network link with the proposed logical network link in the overlay network with a reorganization probability based on the first and second costs and the degrees of the nodes.

2. The method of claim 1 wherein the reorganization probability is dependent upon a change in an energy function caused by replacing the logical network link with the proposed logical network link in the overlay network.

3. The method of claim 1 wherein determining the first cost comprises:

measuring a round trip delay time between the active node and the first neighboring node of the active node within the overlay network.

4. The method of claim 1 wherein determining the second cost comprises:

triggering a measurement of a round trip delay time between the first and second neighboring nodes of the active node within the overlay network.

5. The method of claim 1 wherein determining the first cost comprises:

determining an available bandwidth in the logical network link between the active node and the first neighboring node of the active node within the overlay network.

6. The method of claim 1 wherein determining the second cost comprises:

determining available bandwidth in the proposed logical network link between the first and second neighboring nodes of the active node within the overlay network.

7. The method of claim 1 further comprising:

randomly selecting the first neighboring node of the active node from a local address list of the active node.

8. The method of claim 1 wherein the overlay network is an unstructured overlay network.

9. The method of claim 1 further comprising:

restricting a subset of neighboring nodes of the active node from reorganization.

10. A computer program product encoding a computer program for executing on a computer system a computer process, the computer process comprising:

determining a first cost associated with a logical network link between an active node and a first neighboring node of the active node within an overlay network;

determining a second cost associated with a proposed logical network link between the first neighboring node and a second neighboring node of the active node within the overlay network; and

reorganizing the overlay network to replace the logical network link with the proposed logical network link in the overlay network with a reorganization probability based on the first and second costs and the degrees of the nodes.

11. The computer program product of claim 10 wherein the reorganization probability is dependent upon a change in an energy function caused by replacing the logical network link with the proposed logical network link in the overlay network.

12. The computer program product of claim 10 wherein determining the first cost comprises:

measuring a round trip delay time between the active node and the first neighboring node of the active node within the overlay network.

13. The computer program product of claim 10 wherein determining the second cost comprises:

triggering a measurement of a round trip delay time between the first and second neighboring nodes of the active node within the overlay network.

14. The computer program product of claim 10 wherein determining the first cost comprises:

determining an available bandwidth in the logical network link between the active node and the first neighboring node of the active node within the overlay network.

15. The computer program product of claim 10 wherein determining the second cost comprises:

determining available bandwidth in the proposed logical network link between the first and second neighboring nodes of the active node within the overlay network.

16. The computer program product of claim 10 wherein the computer process further comprises:

randomly selecting the first neighboring node of the active node from a local address list of the active node.

17. The computer program product of claim 10 wherein the overlay network is an unstructured overlay network.

18. The computer program product of claim 10 wherein the computer process further comprises:

restricting a subset of neighboring nodes of the active node from reorganization.

19. A system comprising:

a cost computing module determining a first cost associated with a logical network link between a active node and a first neighboring node of the active node within an overlay network and determining a second cost associated with a proposed logical network link between the first neighboring node and a second neighboring node of the active node within the overlay network; and

a reorganization module reorganizing the overlay network to replace the logical network link with the proposed logical network link in the overlay network with a reorganization probability based on the first and second costs and the degrees of the nodes.

20. The system of claim 19 wherein the reorganization probability is dependent upon a change in an energy function caused by replacing the logical network link with the proposed logical network link in the overlay network.

21. The system of claim 19 wherein the first cost includes a round trip delay time between the active node and the first neighboring node of the active node within the overlay network.

22. The system of claim 19 wherein the second cost includes a round trip delay time between the first and second neighboring nodes of the active node within the overlay network.

23. The system of claim 19 wherein the first cost includes available bandwidth in the logical network link between the active node and the first neighboring node of the active node within the overlay network.

24. The system of claim 19 wherein the second cost includes available bandwidth in the proposed logical network link between the first and second neighboring nodes of the active node within the overlay network.

25. The system of claim 19 further comprising:

a neighborhood node selector randomly selecting the first neighboring node of the active node from a local address list of the active node.

26. The system of claim 19 wherein the overlay network is an unstructured overlay network.

27. The system of claim 19 wherein the first and second neighboring nodes of the active node are selected from a neighbor list maintained by the active node.

28. The system of claim 19 wherein the first and second neighboring nodes of the active node are selected from a neighbor list and further comprising:

an isolated neighbor list restricting a subset of neighbor nodes of the active node from reorganization.